

10

Personal Protective Equipment

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* Revised.

Personal Protective Equipment

10.01 Introduction

Personal protective equipment is not a substitute for adequate engineering or controls, which are always the first levels of protection from hazards. Where a need for personal protective equipment is identified, LLNL provides suitable equipment to protect personnel from hazards in the workplace. Hazards Control shall suggest the type of protective equipment required for the task. The supervisor of the operation shall receive appropriate training, obtain the equipment, and see that it is used properly. It is also the responsibility of the supervisor to ensure that the equipment is adequately maintained.

10.02 Garments

In addition to protective garments, employees shall wear appropriate personal clothing for the work they have been assigned to perform (Section 26.18 of LLNL's *Health & Safety Manual*).

Protective garments such as lab coats, shop coats, and coveralls may be necessary to protect employees who handle hazardous materials. When a need for such a garment is identified, it shall be furnished by the Laboratory.

The type of garment that will provide the best protection for a job will depend on the nature of the job and the physical and chemical hazards associated with the job. For example, where highly toxic or carcinogenic materials (other than radioactive materials or beryllium) are to be used, disposable protective clothing shall be worn rather than reusable clothing. The Hazards Control Safety Team for your area shall be contacted for assistance in determining the protective garment best suited to an operation. It is the responsibility of the supervisor of an operation to provide the protective garments specified for a job and enforce their use. The supervisor shall also ensure that reusable protective garments are laundered on a regular basis.

To obtain items that are stocked by Central Supply, submit a Stores Material Order Form (RL-1696) that has been approved by an authorized

person listed in the Account Authorization Book. If special, non-stocked clothing is required, contact your area Safety Team for assistance.

At Site 300, garment issue and laundry pickup are handled by the Supply Department (see *Site 300 Safety and Operational Manual*).

Laundry Service

Laundry service is available for soiled garments. *Under no circumstances shall potentially contaminated garments (e.g., those involved in an unusual incident, such as a large chemical or radiation spill) or garments suspected of being contaminated with highly toxic or carcinogenic materials be submitted for routine laundry service.* Hazards Control Safety Team representatives shall provide guidance for handling garments contaminated as described above.

Routinely soiled garments shall be cleaned regularly. The procedure for cleaning soiled garments depends on the nature of the potential contaminants. There are two commercial laundry services on contract with LLNL. One laundry service handles radioactively or beryllium-contaminated clothing. This service is provided through the Hazardous Waste Management Division of the Environmental Protection Department. The other laundry service, which is provided through the Supply and Distribution Department, handles other protective garments used at LLNL.

Procedure for Handling Radioactively and Beryllium-Contaminated Laundry

Garments contaminated with radioactive material shall be cleaned by special methods. Each garment sent for cleaning shall not exceed a total of 0.1 μCi of alpha emitter; 5 mrem/hr at contact of a beta/gamma emitter (when monitored with a GM detector—beta shield open); or 0.1 μCi of tritium.

Note: The LLNL blue alpha meter is calibrated to read out with 50-percent efficiency for 4π geometry. To obtain the total activity per probe area, multiply the ratemeter reading by a factor of 2. For example, if the ratemeter indicates 11,000 dpm, the total activity present is 22,000 dpm (or $10^{-2} \mu\text{Ci}$). Garments with contamination at higher levels shall be discarded as radioactive waste.

Guidance on disposing of radioactively contaminated waste is described in Section 4 of the *Environmental Protection Handbook*. Monitoring instructions for determining these concentrations can be obtained from your area Safety Team.

Any group needing laundry service for contaminated garments is required to do the following:

- Collect soiled items in a plastic bag and seal the bag with plastic tape only.
- Package separately and mark "Contaminated with _____" on all garments contaminated with greater than 22,000 dpm (0.1 μ Ci) of alpha emitter or 0.2 mrem/hr of a beta/gamma emitter on the surface.
- Place the plastic bag in an orange cloth laundry bag and seal the opening with a cord only.
- Prepare a Contaminated Laundry Transmittal (LL-2430) and either a Controlled Materials Identification (CMID) tag (LL-3076) or a Hazardous Waste Management (HWM) tag (LL-5344). Either form is acceptable.
- Attach the yellow and blue copies of the Contaminated Laundry Transmittal and the CMID or HWM tag to the outer bag.
- Deposit the bag at a designated pickup point.

The rest of the procedures for handling contaminated garments are the same as those for handling uncontaminated garments, except that bags are not opened and verified by the laundry clerk.

If any laundered garment is found to have contamination levels exceeding 20,000 dpm (alpha emitter), or any spot on the garment exceeds either 2,000 dpm or 0.2 mrem/hr (beta/gamma emitter) above local background, the garment shall be relaundered.

Garments contaminated with beryllium shall be brought to the attention of the Hazardous Waste Management Division, who shall provide instructions on handling and laundering.

Procedure for Handling Uncontaminated Laundry

The user group is required to do the following:

- Collect and count soiled garments.
- Fill out a laundry form (LL-5091) indicating the garment count and user group.
- Put the garments in a laundry bag.
- Deposit the bag at designated pickup points.

Clothing is picked up and returned weekly by Transportation. The Central Supply Clerk coordinates all deliveries and pickups with the laundry service. The user shall compare the number of clean garments returned against the tally of those sent

out. Discrepancies and questions shall be addressed to Central Supply.

10.03 Foot Protection

Safety Shoe Policy

LLNL provides safety shoes for employees who are regularly assigned to work where there is a moderate to high risk of foot injuries. This does not, however, include employees whose duties require incidental access or infrequent or brief walk-throughs of the area.

Safety shoes are normally furnished to and shall be worn by employees who work in the following areas:

- Construction sites, craft maintenance facilities, and machine shops.
- Nevada Test Site (NTS) ground zero and tunnel and construction areas.
- Coal pits, when required by mine safety rules.
- Drill rigs, when required by rule or policy.
- Offsite exploratory work in rough terrain.

Note: For offsite duties, 6-in.-high boots (or higher) with laces shall be worn.

Supervisors are responsible for evaluating job assignments to determine the need for foot protection and for establishing a system of controlling and recording the issuance of safety shoes. Normally LLNL will furnish one pair of shoes per year; however, shoes shall be replaced sooner if, in the supervisor's opinion, the shoes are unserviceable as a result of excessive wear or extreme conditions in the work environment. Hazards Control may be contacted for assistance in evaluating the need for foot protection.

Shoes furnished for contamination control shall be color coded—Hazards Control will provide guidance. Supervisors are responsible for enforcing the rules controlling the use of safety shoes in contaminated areas.

Obtaining Shoes

To obtain LLNL-furnished safety shoes, submit a completed Safety Shoe Authorization Form (LL-4063) to the shoe-mobile clerk. The signature of the employee's supervisor and a valid account number from the Account Authorization Book are required for each pair of shoes issued. LLNL will pay a portion of the cost. Contact the Safety Services Division of Hazards Control (ext. 3-3729) for current information.

Safety shoes can be obtained from the shoe-mobile at Livermore, Site 300, and NTS. At Livermore and Site 300, only the approved form LL-4063 is needed. Employees at NTS shall pay cash and submit the receipt and an approved form LL-4063 to Business Services for a refund. Safety shoes may be purchased from the shoe-mobile by anyone. Other forms of foot protection such as steel toe caps are available when needed. Additional information and shoe-mobile locations and schedules can be obtained from your area Safety Team.

10.04 Hand Protection

Hand protection may be required for the safe performance of a job. The type of hand protection required depends on the hazards associated with the job; i.e., whether the potential hazard is exposure to chemicals, flame, heat, abrasives, cuts, electrical devices, etc. When protection from chemicals is required, the type of protection required will depend on the chemicals being used. Contact your area Safety Team for assistance in selecting the best hand protection for your particular job.

Central Supply stocks frequently used items (see the LLNL stock catalog, group-class 8415 for gloves and group-class 7930 for creams). Departments with special needs shall procure their own hand protection.

Gloves for Protection from Chemical Hazards

Table 10-1 is a guide for selecting a glove material that will serve as an effective barrier against many of the substances commonly found around LLNL. Each glove material has its limitations and, therefore, shall be carefully matched to the substance that will be encountered.

Research on glove materials shows that (1) each glove material temporarily resists solvent breakthrough, but eventually some permeation will result; (2) the same glove material from different suppliers may vary in its permeation characteristics; and (3) a glove that swells indicates excessive permeation has occurred. Disposable gloves shall be discarded after each use. Reusable gloves shall be inspected regularly for damage and replaced when necessary. They shall be stored in a protected location away from chemical exposure when not in use. Avoid wearing contaminated gloves outside

Table 10-1. Recommended glove materials for use with various chemical hazards.

Chemical Hazards	Butyl	Neo- prene ^a	Nitrile ^b	Polyvinyl chloride	Polyvinyl alcohol	Latex	Poly- ethylene	Viton
Acids, dilute	+	+	+	+	-	+	-	+
Alcohol	+	+	+	+	-	+	+	+
Alkali (bases), dilute	+	+	+	+	-	+	-	+
Aromatics	-	-	-	-	+	-	-	+
Chlorinated hydrocarbons	+	-	+	-	+	-	-	+
Epoxy resins	+	+	+	+	-	-	-	+
Esters	+	-	-	-	-	-	-	-
Hydrocarbons	+	+	+	-	+	-	-	+
Ketones (acetone, (MEK, etc.)	+	-	-	-	-	-	-	-
Lacquer thinner	+	+	+	-	+	-	-	+
Oils, grease	+	+	+	+	+	-	-	+
Petroleum distillates, mineral	+	+	+	-	+	-	-	+
PCBs	-	-	-	-	-	-	-	+

^a Playtex gloves, which are made of neoprene and latex, can be classified with neoprene.

^b Also called Buna-N.

+ Recommended.

- Not recommended

the immediate operation area to prevent spreading contamination.

Heat-Resistant Gloves

Asbestos gloves are not permitted for general use. Central Supply stocks a silica-based glove (Stock No. 8415-71339) which will provide heat protection to 1100°C. If this is inadequate, consult the Industrial Hygiene Group of Hazards Control for exception to the restricted use of asbestos.

Creams

Gloves are usually the method of choice for protecting hands from chemical hazards. However, under some circumstances, properly used protective hand creams are also effective barriers against skin irritants. Frequent application and removal ensure the most effective results. Washing with soap and water, which removes both the cream and whatever may be dissolved in it, shall always be done before eating and smoking to prevent hand-to-mouth contamination. Two types of creams are available from Central Supply:

- Water-repellant cream—protects skin from water and chemicals dissolved in water.
- Water-miscible cream—protects skin from dry substances and nonaqueous materials.

10.05 Respiratory Protection

Various forms of airborne contaminants are generated by many Laboratory operations. The incidence of occupational illnesses caused by toxic dusts, fumes, mists, gases, and vapors is best controlled using accepted engineering control methods to prevent the air from becoming contaminated. However, there will always be circumstances in which engineering methods will not be practical or sufficient. In such cases, respiratory protective equipment shall be used. Note that experiments shall be planned to prevent prolonged wearing of respiratory protective devices. A summary of the respiratory protection program is given below.

LLNL Respiratory Protection Program

To ensure that respirators are used effectively to reduce exposure, supervisors and employees shall contact the Hazards Control and Health Services Departments. Use of respirators requires prior assessment of need, medical approval, and annual fitting and training. All respirators used at LLNL shall be either approved by the National Institute for Occupational Safety and Health

(NIOSH) or tested and accepted through the Respiratory Studies Program (DOE Order 5480.10).

Need for Respirators. Contact your area Safety Team for assistance in all aspects of respirator use and selection. A member of the Safety Team shall perform a hazard assessment and specify the type of protection needed for each type of operation. This shall be documented by an Operational Safety Procedure (OSP) or Hazards Assessment form.

Supervisor Approval. Obtain form LL-6150 from Forms Issues (ext. 2-7513), your Safety Team, or the Respirator Facility in Bldg. 324, and complete one for each employee who will be using a respirator. Annual renewal notices for medical approval, fitting, and training will be sent to the employee. Supervisors are responsible for periodically monitoring the use of respirators to ensure that they are worn properly and that all employees using respirators are currently approved.

Medical Approval. All potential users shall be approved for respirator use by the Health Services Department. Physical exams are required every 3 years. Appointments for physical exams can be arranged by calling ext. 4-4523. For those without health problems, an interview with a nurse shall be completed in the years falling in between physical exams. Interviews are available on a drop-in basis. Refer to recertification notification for drop-in hours.

Fitting and Training. Respirator Service of the Industrial Hygiene Laboratories Group of Hazards Control (Bldg. 324) is responsible for fitting employees with the right masks and training them in the proper use of the equipment. Half-mask fitting is offered on Tuesdays and Thursdays, 8:30 to 11:00 a.m. and 1:00 to 3:00 p.m. Appointments are necessary for full-face mask fittings because the fitting is more time consuming. Respirator fitting and training are always done after medical approval is given.

Supervisors. Supervisors of employees who use respirators are required to attend Hazards Control course HS-466, "Respiratory Training for Supervisors of (Respirator) Users and/or Custodians of Respirators (those issuing respirators)" to ensure the proper use of respirators. Contact your area Safety Team for information on supervisor training.

Supervisors are responsible for ensuring that employees are provided with information concerning the hazards for which the respiratory protective equipment has been required in an area. Contact the area Safety Team to assist in providing information to employees.

Specific training in the hazards of particular operations and the protection factors of various respirators will be provided by the industrial hygienist or health physicist for the area Safety Team. Supervisors shall allow sufficient time for training to be completed before operations begin, especially for infrequently used respiratory protection equipment.

Supervisors are responsible for ensuring that each respirator stored for emergency use is inspected at least once a month. A record of the inspection shall be entered in a log book by the inspector and the entry verified by the supervisor.

Self-Contained Breathing Apparatus. Those requesting self-contained breathing apparatus (SCBA) should get supervisor approval using form LL-6150; then contact the Health Services Department for an appointment to obtain medical approval. This approval, comprising a physical examination, pulmonary function examination, and electrocardiogram, is required annually. Next, the employee should call Respirator Services to arrange an appointment for fitting and to schedule the training class, also required annually.

Respirator Custodian. After training and fitting users, Respirator Service provides an initial supply of respirators to the respirator custodian for the area. The respirator custodian is an individual designated by Hazards Control—usually the health and safety technician or the supervisor for the area. Only persons trained to ensure that proper respirators are issued shall be permitted to give respirators to users. Refer to the OSP or written Hazards Assessment for the respirator's limitations and required frequency of exchange.

The respirator custodian is responsible for ensuring that an adequate supply of respirators is maintained, and that only fitted and trained individuals use the respirators provided. The respirator custodian is also responsible for ensuring that respirators are returned to Respirator Services for cleaning and maintenance. Respirator Services will maintain all respirators, including cleaning and replacing parts. Replacement costs for missing or lost respirators shall be charged to the program.

Employees. Users shall inspect the respirator before each use to ensure that it is in proper working condition. Facial hair (such as beards and mustaches) that comes between the sealing periphery of the face piece and the face or interferes with valve function is prohibited. Fitting and testing will not be performed on persons with such facial hair. Spectacles, goggles, face shields, or welding hel-

metts shall not be worn in a way that adversely affects the seal of the facepiece to the face.

Contract Workers. Contract workers who are under the direct supervision of an LLNL employee shall be provided with respiratory protective equipment. LLNL supervisors shall initiate the procedures described above to obtain hazard assessments, medical approval, fitting, and training. Medical approval is provided to contract workers by a physician during a scheduled appointment after completing required tests. Call Health Services (ext. 2-7462) for more information. This does not extend to independent contractors or construction subcontract employees. Any questions on use of respirators by non-LLNL employees should be referred to your area Safety Team.

For information on any aspect of respiratory protection, consult your area Safety Team.

Respirator Use by Livermore Employees at the Nevada Test Site

Any Livermore employee who will be working at NTS and anticipates the need for respiratory protection shall be medically approved, fitted, and trained before traveling to NTS. The medical approval, fitting, and training shall be repeated annually.

A list of those employees who have been medically approved, fitted, and trained is kept by the LLNL-Nevada Health and Safety Office. Livermore employees who may be required to wear respirators while at NTS shall report to this office upon arrival. Any employee who wears prescription glasses while working in a respirator shall make arrangements with LLNL's optometrist—far in advance of going to NTS—to get prescription glasses that can be mounted in a respirator.

Reynolds Electric Company (REECO), with the concurrence of the LLNL-Nevada Health and Safety Office, selects all respirators at NTS. REECO has the authority to refuse to issue respirators if, in their opinion, there is any question about the propriety of their use (e.g., someone who has recently grown a beard or an employee not authorized by the LLNL-Nevada Health and Safety Office).

In rare instances, REECO may (with the approval of the LLNL-Nevada Health and Safety Office) train employees, fit respirators, and perform necessary physical examinations. This could occur if a situation warranted the use of a respirator and the employee had not received annual medical approval, fitting, or training; however, this practice is discouraged.

10.06 Head Protection

Employees working in areas where there is possible danger of head injury from impact, from falling or flying objects, or when working with high-voltage equipment must wear approved head protection. The supervisor is responsible for determining the need for such protection and ensuring that employees use it when required. Protective head gear can be obtained from Central Supply. A sufficient supply of required protective head gear shall also be provided for visitors at the work site.

10.07 Eye Protection

The Laboratory provides appropriate eye protection devices in areas where hazards to the eyes exist. The supervisor is responsible for determining the need for eye protection, obtaining suitable protective devices, and ensuring that employees use them. Hazards Control shall assist the supervisor in defining eye hazards and selecting appropriate eye protection. An industrial vision consultant is available to advise employees on occupational eye protection.

For employees who wear contact lenses, guidance on eye safety requirements is given in Section 26.09 of this manual.

The standard sign “Caution—Eye Protection Required in This Area” (Stock No. 4280-34841) shall be posted in all areas where eye protection is mandatory. Employees who work in these areas shall wear the eye protection issued to them. Visitors to the area shall also be provided with suitable eye protection.

Types of Eye Protective Equipment

Eye protection devices fall into the following four categories:

- Personal safety glasses—issued through Hazards Control;
- Goggles, face shields, etc.—available from Central Supply;
- Temporary safety glasses for visitors; and
- Laser safety glasses—requires approval by the Laser Safety Officer (ext. 2-5263).

Table 10-2 is a guide for selecting the devices that will provide adequate eye protection for various operations. Table 10-3 lists the lens shades recommended for protecting the eye against glare and welding. If eye protection is needed for situations not listed in Table 10-3, consult Hazards Control.

Eligibility

All employees and approved contract personnel who are permanently assigned to or routinely work in eye-hazard areas are eligible to obtain personal safety glasses at Laboratory expense.

Note: “Routine work” is not related to hours spent, but to repeated contact with eye hazards. Eye hazard areas are those areas where flying particles are encountered (machine shop areas where portable, power hand tools are used), hazardous liquids are handled (chemical laboratories and plating and plastic shops), or where there is constant exposure to intense light. Eligibility for safety glasses does not automatically qualify an employee for free sunglasses. Sunglasses will not be routinely issued to employees unless they are justified by the employee’s working conditions. However, each circumstance must be reviewed and approved by the industrial vision consultant and the Safety Services Division Leader.

Issuance of Prescription Safety Glasses

An LLNL Authorization Form (RL-2588) with the supervisor’s signature shall be submitted to Safety Glasses (Bldg. 663) by the employee before prescription safety glasses can be ordered. The employee will be called and an appointment scheduled with the industrial vision consultant for a preliminary fitting. When the glasses have arrived from the vendor, the employee will be notified and scheduled for a final fitting.

The following rules apply to the issuance of prescription safety glasses:

- New employees shall have up-to-date prescriptions.
- Prescriptions that are older than 1 yr normally shall not be accepted from any employee.
- Prescription orders cannot be telephoned.
- Prescriptions must be on a refractionist’s card or on stationary signed by the refractionist.
- Only one pair of prescription safety glasses normally will be authorized for an employee.
- Replacement glasses will be authorized if the current pair has been scratched or broken or if a new prescription has been obtained.

Employee and Retiree Low-Cost Purchase Plan

A low-cost plan for purchasing prescription safety glasses and replacement parts is available to Laboratory employees and retirees. Glasses purchased on this plan must be promptly paid for by check. If the employee or retiree has difficulty adjusting to the new prescription, LLNL will not

Table 10-2. Eye-protection equipment for various operations and material exposures.^a

Chemicals	Grinding, buffing, polishing
<ul style="list-style-type: none"> • Face shield^b • Ventilated clear-plastic goggles^{c,d} 	<ul style="list-style-type: none"> • Face shield^b • Safety glasses with removable plastic side shields^e • Ventilated clear-plastic goggles^d
Chipping	Lasers
<ul style="list-style-type: none"> • Face shield^b • Ventilated clear-plastic goggles^d • Safety glasses with removable plastic side shields^e 	<ul style="list-style-type: none"> • Special laser glasses^{e,j}
Compressed air use	Machine and hand-tool operations
<ul style="list-style-type: none"> • Ventilated clear-plastic goggles^d • Personal safety glasses^e • Safety glasses with removable plastic side shields^e 	<ul style="list-style-type: none"> • Face shield^b • Personal safety glasses^e • Safety glasses with removable plastic side shields^e • Ventilated clear-plastic goggles^d
Dust	Molten material handling
<ul style="list-style-type: none"> • Ventilated clear-plastic goggles 	<ul style="list-style-type: none"> • Face shield^b
Electrical work	Silver soldering
<ul style="list-style-type: none"> • Personal safety glasses with plastic frames and side shields^e • Face shield^b 	<ul style="list-style-type: none"> • Calobar clip-ons^{e,c} • Welding goggles^{f,g} • Welding goggles plate holder^{f,h} • Welding helmet^{f,i}
Forging	Welding, cutting, burning (acetylene)
<ul style="list-style-type: none"> • Face shield^b • Personal safety glasses^e • Safety glasses with removable plastic side shields^e • Ventilated clear-plastic goggles^d 	<ul style="list-style-type: none"> • Welding goggles^{f,g} • Welding goggles plate holder^{f,h} • Welding helmet^{f,i}
Furnace operations	Welding (spot and butt)
<ul style="list-style-type: none"> • Calobar clip-ons • Welding goggles^{f,g} • Welding goggles plate holder^{f,h} • Welding helmet^{f,i} 	<ul style="list-style-type: none"> • Face shield^b • Personal safety glasses^e • Safety glasses with removable plastic side shields^e • Ventilated clear-plastic goggles^d
Glass blowing	
<ul style="list-style-type: none"> • Didymium clip-ons^{e,c} 	

^a Contact Hazards Control for aid in selecting and obtaining special eye protection.

^b Central Supply Stock Nos. 4240-58220 and -58221 (two parts).

^c With safety glasses.

^d Central Supply Stock No. 4270-57083.

^e Available from the industrial vision consultant (ext. 2-5190).

^f See Table 10-3 for recommended shades.

^g Central Supply Stock No. 4270-34800.

^h Central Supply Stock No. 4270-44546 (plus appropriate lens).

ⁱ Central Supply Stock No. 4240-34565.

^j Contact Hazards Control's Industrial Safety Group (ext. 2-5263).

Table 10-3. Recommended lens shades for welding and glass-blowing operations.

Operation	Lens shade number
Oxyacetylene torch cutting and welding:	
Soldering	Medium calobar
Brazing	3 or 4
Cutting	
Light, less than 1 in.	3 or 4
Medium, 1 to 6 in.	4 or 5
Heavy, greater than 6 in.	5 or 6
Welding	
Light, less than 1/8 in.	4 or 5
Medium, 1/8 to 1/2 in.	5 or 6
Heavy, greater than 1/2 in.	6 or 8
Arc welding:^a	
Metal or helium arc	
1/6- to 3/32-in.-diameter rod	10
3/32- to 1/8-in.-diameter rod	10
1/8- to 5/32-in.-diameter rod	11
Metal arc	
3/16- to 7/32-in.-diameter rod	12
1/4-in.-diameter rod	13
5/16- to 3/8-in.-diameter rod	14
Atomic arc	14
Carbon arc	14
Glass blowing:	Didymium

^aIn gas-shielded arcs (helium or argon), use shades 11 through 14.

reorder new glasses. Because LLNL is providing glasses at cost, corrections must be handled by the prescribing doctor or the employee.

10.08 Hearing Protection

The Laboratory provides hearing protection for employees who may be exposed to excessive noise levels. Protective devices are used as an interim measure until an engineering solution is found to control the noise, unless the particular job is temporary. Hazards Control shall notify management of the areas where hearing protection is necessary and the type of protective device needed. Ear muffs and foam plugs are available from Central Supply. Individually fitted ear plugs are provided by Health Services.

Further information on noise standards and methods of measurement, evaluation, and control is available in Supplement 10.08 of this manual.

10.09 Fall Protection

LLNL has available specialized protective devices for employees who work at elevated locations or in confined spaces. Fall protection shall be worn when a fall hazard exceeds 10 ft. A full-body harness is generally recommended over the use of a safety belt. Certain conditions such as where a potential for a free fall exists, working in confined spaces when attached to a lifeline, or work from suspension scaffolds require the use of a full-body harness. Equipment from various manufacturers shall not be mixed because this could compromise the safety provided by each piece.

Lifelines, safety belts, full-body harnesses, and lanyards shall be used only for employee safeguarding. Any lifeline, safety belt, full-body harness or lanyard actually subjected to inservice loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding.

Because of the potential for serious injury or death, work planning is vital in situations where fall protection is required. General guidelines for planning fall protection are listed below:

- List each fall exposure.
- Determine worker's vertical and horizontal movement.
- Evaluate strength of anchor point.
- Plan anchoring system.
- Select and obtain correct equipment.
- Train workers.
- Maintain equipment.

Chapter 2 of this manual covers work planning in greater detail. Before performing work in these situations, contact your area Safety Team for assistance in evaluating the most effective type of fall protection device. These devices, which include Class I safety belts and Class III safety harnesses and lanyards, are available from Central Supply; however, such devices shall be issued only with the approval of the Industrial Safety Group of Hazards Control.

When fall protection equipment is issued, the purchaser shall also get an LLNL Fall Protection Equipment Inspection tag (Stock No. 4280-71009). The tag shall be completed and attached to a solid point on the fall protection equipment with a cable tie.

Fall protection equipment shall be inspected before each use and every 6 months (to be recorded on the tag) in accordance with the manufacturer's guidelines. The manufacturer's inspection guidelines may be a part of the literature enclosed with

the fall protection equipment at the time of purchase. This information is also available from the Industrial Safety Group (ext. 2-5249).

All users of fall protection equipment shall be trained in the proper selection, use, and maintenance of the equipment. Hazards Control offers course

HS-596 (Fall Protection for Elevated Locations) to fulfill this requirement and provide further information on fall protection equipment, as well as possible solutions to fall hazards at elevated locations.